

**THE GHOST MAP:
THE STORY OF LONDON'S MOST
TERRIFYING EPIDEMIC — AND HOW IT
CHANGED SCIENCE, CITIES, AND THE
MODERN WORLD**

By Steven Johnson
Riverhead, 2006

Set in 1850s London, *The Ghost Map* is a superb detective tale of urban density, disease, fortitude, and plumbing. Steven Johnson tells, with page-turning mastery of urban and scientific detail, how the great metropolis was saved from cholera by one doctor's pursuit of a microbe. Think *Nova* meets Sherlock Holmes, with Dickens providing local color.

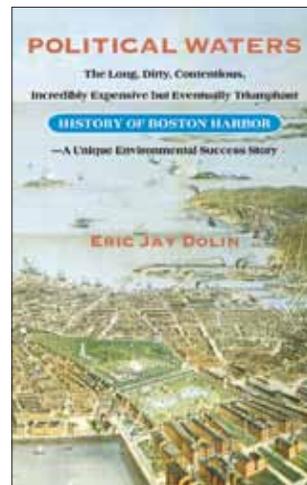
Johnson brilliantly portrays London, the first modern mega-city. In 1854, the population density of the city's Soho district was 432 per acre, or 276,000 per square mile. Compare Boston's South End, with 21,000 per square mile, or New York's Lower East Side with 101,000. Triple that to approximate the human packing of Victoria's Soho, and still you'd be clueless of its malodorous, vomit-inducing stench: streets steeped in manure, shops teeming with livestock slaughter, tanneries, all manner of coal-fired industry — each emitting pungent airs. Worse was the reek of excrement pooling in fetid courtyards and cellars: as rural people poured into London, tripling its population in 50 years, human waste clogged the ancient system

of cesspools and dung-handlers. Newly fashionable “water closets” made matters worse: the average household flushed 244 gallons daily into non-existent sewers. Enter the epidemic. Bacteria *Vibrio cholerae* had been around for millennia, checked by the human instinct against ingesting excrement, and widespread taste for the salutary antimicrobial effects of alcohol and tea. But London's lethal stew was a perfect host for cholera outbreaks that decimated neighborhoods every few years. Johnson describes London as “permanent, rolling disaster, a vast organism destroying itself by laying waste to its habitat.”

The detective of the story, physician John Snow, discovered the truth that cholera is waterborne and becomes epidemic when drinking supplies mix with human waste. Victorian doctors correlated smelly streets with cholera and promoted “miasma” theories of airborne contagion. Noting that cholera attacked intestines and not lungs, Snow pursued his waterborne theory, though ridiculed by the medical establishment. Fearlessly visiting the dying to trace water supplies, he eventually linked the victims to a single well that abutted a hidden cesspool and convinced authorities to remove the pump handle. In that one act, he arrested a raging epidemic and founded the profession of epidemiology. (The John Snow pub marks this site today — high British honor.)

Johnson's epilogue flashes forward to post-9/11 terrors facing cities today: ebola, anthrax, H5N1 influenza, jihad. Johnson worries most for urbanism when the nuclear-armed “dirty bomb” terrorist arrives. City life would be destroyed, he says, lessened by each look over the shoulder. I wonder how true that is. Urbanites show grit in adversity, comrades in courage and civility, exemplified best by the author's subject, London. Cholera, the Blitz, smog, floods, the IRA, the 2005 Underground bombs — this great metropolis survives, and is greater for its trials. London calling.

Robert Taylor is a principal of Taylor & Burns Architects in Boston.



**POLITICAL WATERS: THE LONG, DIRTY,
CONTENTIOUS, INCREDIBLY EXPENSIVE
BUT EVENTUALLY TRIUMPHANT HISTORY
OF BOSTON HARBOR — A UNIQUE
ENVIRONMENTAL SUCCESS STORY**

By Eric Jay Dolin
University of Massachusetts Press, 2004

Boston has been profoundly affected by sewage. Though many histories have been written about Boston, most have failed to find drama in the history of its sewage. *Political Waters* recounts the roller-coaster of events that brought one of America's best-known harbors into and then, remarkably, out of environmental despair.

From Boston's earliest days, sewage was considered an unpleasant nuisance. Successful sewer management was measured by how quickly the wastes could be conveyed away from basements and streets — albeit to the shallow shoreline waters of Boston Harbor. But it wasn't long before this “very stinking puddle” became a health concern, and public outcry coupled with emerging medical evidence demanded regulatory action — and the unofficial start of a near-two-century battle with managing sewage discharge.

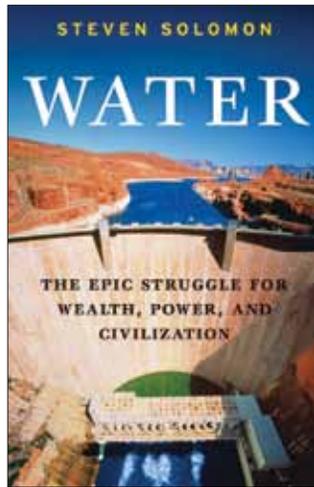
Early attempts to solve the sanitation issue pushed the issue further “downstream” (deeper into the harbor), and the degradation of Boston Harbor continued well into the 20th century with little notable progress made. Dolin successfully paints

the picture of the public's ignorance of a pending environmental crisis; after all, the sewers appeared to be doing their job and wastewater was "out of sight, out of mind." But when legal and political events began to converge and Boston's "harbor of shame" became a national laughingstock during the 1988 Bush-Dukakis election, sewage was brought back into the public eye.

The book provides a factual and seemingly unbiased account of the events that ultimately led to the successful cleanup of Boston Harbor. As Dolin recounts the political decisions and engineering responses implemented throughout the course of history, he also presents numerous opposing points of view and alternative recommendations. Interestingly enough, some of the concerns voiced even in the early 1800s presaged environmental concerns today. For example, when the question of solutions for sewer and stormwater flows arose, the decision to combine them was made in order to avoid the cost of constructing double sewer lines and to allow storm flows to periodically flush out the sewers — despite some objections. Today, nearly a decade after the completion of the Boston Harbor project, combined sewer overflows (CSOs) pose a lingering threat, and an expensive multi-year CSO project is still underway in Boston and surrounding communities.

Now that we have our Deer Island treatment plant, 43 communities flush their toilets without worry. And 51 communities continue to turn on their faucets knowing that clean water from the Quabbin Reservoir will arrive. Dolin's portrait of a public oblivious to impending crisis forces the question of whether the Greater Boston area today might be similarly oblivious to a looming crisis. Our waters are still impaired, and we have yet to solve the problems from stormwater runoff — CSOs, inflow/infiltration, nonpoint source pollution, and aquifer depletion. Are we doing enough?

Nicole Holmes PE, LEED AP BD+C is a civil engineer and project manager at Nitsch Engineering in Boston.



WATER: THE EPIC STRUGGLE FOR WEALTH, POWER, AND CIVILIZATION

By Steven Solomon
Harper, 2010

Subtitled "The Epic Struggle," *Water* is itself an epic work of anthropocentric political history in classic Western mode. Steven Solomon's research into the relationship between cultural evolution and water is massive and perhaps unprecedented. In the notes preceding his "selected" bibliography, the author describes the challenges he faced: on the one hand, a dearth of books similarly investigating the role of water in history and, on the other hand, a glut of recent literature addressing today's water issues — material too vast to include in a bibliography. Thus his many substantive chapter notes have an important role.

In *Water's* enjoyable and dense pages, I found myself wishing for a presentation in reverse timeline or in some multi-threaded format. This might have allowed his concluding discussion of today's global water science to complement the restatement of the history of "civilization" that is the focus of much of his attention. Solomon's use of the term "civilization" — and many other terms used to identify the phases of cultural evolution — is ambiguous. In cultural anthropology, "civilization" refers to a phase of culture energized by the invention of agriculture and evolved during the "agricultural revolution." The

culture in which we have lived since the 18th-century "fuel revolution" might be termed a "post-civil culture of abundance" (enabled by fossil fuel and fossil water) — now in the process of morphing into a later phase, perhaps the "efficiency revolution." All of these cultural phases are threaded through Solomon's text but ultimately rolled into the catchall "civilization," as in his prologue: "[Future] civilization will be shaped as well by water's inextricable, deep interdependencies with energy, food and climate change." But it is useful to understand we are at least two evolutionary steps away from that cultural phase.

Water is a worthy companion to Jared Diamond's *Collapse*, similar in its effort to discover lessons of human history related to bioregional context. Oddly, *Water* does not deal with the powerful integrating force of current global culture, instead assuming that the planet will continue to encompass many semi-autonomous nations of water haves and have-nots. A striking example is the minimal inclusion of considerations of global trade in "virtual water" (embedded water), which dramatically alters local water use. Another is his light treatment of the challenges of bioremediation and restoration of natural biodiversity. The lack of discussion of the wholesale displacement of populations necessitated by rising sea levels and the effects of climate change is also significant.

Read *Water*. It takes the form of an evocative string of engaging historic narratives and carefully researched information. Although much of that information is limited to the standard Western bias of its historic sources, the book's anthropocentrism is innocent and readily identified. *Water* is an honest and scholarly effort both to remind everyone that water is the basis of all life on earth and to trace the history of human technologies and the societies using them.

Philip Norton Loheed AIA is a principal of BTA+Architects in Cambridge, Massachusetts and president of the nonprofit Earthos Institute in Somerville, Massachusetts.